

What is claimed is:

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1. A system for accessing a region of memory in a computer, the system comprising:
 - a memory region table for supporting memory region translations, the
 - 5 memory region table residing on a module external to and in communication with an operating system; and
 - a memory window table, the memory window table being in communication with the memory region table, and residing on a module external to and in communication with the operating system.
 - 10 2. A system according to claim 1, wherein the memory window table includes a field for recording a memory region entry and a field for recording a memory window entry.
 3. A system according to claim 1, wherein the memory region table virtually resides in the operating system of the computer.
 - 15 4. A system according to claim 1 or 2, wherein the memory region table comprises:
 - a field for recording a physical address corresponding to a first memory location of a memory region;
 - a field for recording an access value corresponding to the memory region;
 - 20 a field for recording a protection domain value corresponding to the memory region; and
 - a field for recording a length of the memory region.
 5. A system according to claim 1 or 2, wherein the memory window table further comprises:
 - 25 a field for recording a region remote access key for accessing a memory region; and
 - a field for recording a window remote access key corresponding to the memory window.
 6. A system according to claim 5, wherein the memory window table further
 - 30 comprises:
 - a field for recording a virtual address corresponding to a first memory

location within a memory window;

a field for recording a length of the memory window; and

a field for recording an access value corresponding to the memory window.

5 7. A system according to claim 6, wherein the memory window table further comprises a field for recording a protection domain value corresponding to the memory window.

8. A remote access key for accessing a memory region table or a memory window table, each of the memory region table and memory window table being
10 resident on a computer readable medium, the remote access key comprising:

a field for recording a bit that indicates whether the remote access key corresponds to a memory region or a memory window translation.

9. A remote access key according to claim 8, further comprising a field for recording a window table access key.

15 10. A remote access key according to claim 8, further comprising:

a field for recording a protection domain value corresponding to a memory window table entry;

a field for recording an index corresponding to a memory window table entry; and

20 a field for recording a region key corresponding to a memory region table entry.

11. A method for binding a memory window to a memory region without invoking an operating system kernel, the method comprising:

25 reading pointers to a memory window table entry and a memory region table entry associated with a bind request, the memory window table and the memory region table each residing in a module external to and in communication with the operating system;

reading the memory region entry and memory window entry;

determining access privileges associated with the bind request;

30 determining whether the memory window associated with the memory window entry is contained in the memory region associated with the memory

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region entry; and

updating the memory window entry to include a memory region table index corresponding to bind the memory window to the memory region if the memory window is contained in the memory region access is permitted.

5 12. A method according to claim 11, further comprising generating a memory window remote access key corresponding to the memory window.

13. A method according to claim 11, wherein determining access privileges associated with the bind request includes comparing a protection domain value in the memory region entry with a protection domain value in the memory window
10 entry and a protection domain value corresponding to a work queue invoking the bind request.

14. A method according to claim 11, wherein determining access privileges associated with the bind request includes comparing an access value in the memory window entry with an access value in the memory region entry.

15 15. A method according to claim 11, wherein determining whether the memory window associated with the memory window entry is contained in the memory region associated with the memory region entry includes comparing a length in the memory window entry with a length in the memory region entry.

16. A method according to claim 11, wherein determining whether the
20 memory window associated with the memory window entry is contained in the memory region associated with the memory region entry includes comparing a virtual address in the memory window entry with a virtual address in the memory region entry;

17. A method for binding a memory window to a memory region without
25 invoking an operating system kernel, the method comprising:

. reading pointers to a memory window table entry, a first memory region table entry, and a second memory region table entry associated with a bind request, the memory window table and the memory region table residing on a module external to and in communication with the operating system;

30 reading the first memory region entry, the second memory region entry, and the memory window entry;

determining access privileges associated with the bind request;

determining whether the memory window associated with the memory window entry is contained in the memory region associated with the memory region entry; and

5 updating the memory window entry to include a memory region table index to bind the memory window to the memory region if the memory window is contained in the memory region and access is permitted.

18. A method according to claim 17, further comprising generating a memory window remote access key.

10 19. A method according to claim 17, wherein determining access privileges associated with the bind request includes comparing a domain value in the memory window entry with a domain value in the second memory region entry and a domain value corresponding to a work queue invoking the bind request.

20. A method according to claim 17, wherein determining whether the
15 memory window associated with the memory window entry is contained in the memory region associated with the memory region entry includes reading a length in the memory window entry.

21. A method according to claim 17, wherein determining whether the
20 memory window associated with the memory window entry is contained in the memory region associated with the memory region entry includes comparing a virtual address in the second memory region entry with a virtual address in the first memory region entry.

22. A method according to claim 17, wherein determining whether the
25 memory window associated with the memory window entry is contained in the memory region associated with the memory region entry includes comparing a length in the second memory region entry with a length in the first memory region entry;

23. A method according to claim 17, further comprising offsetting the length in the memory window entry to create a index start value and an index end value
30 and resetting an index in the memory window entry to a value between the index start value and the index stop value.

24. A memory window table for accessing a memory region, the memory window table residing on a computer readable medium in communication with an operating system kernel, the memory window table comprising:
- a field for recording a memory window record; and
 - 5 a field for recording a memory region record.
25. A memory window table according to claim 24, wherein the memory window record includes a protection domain value for the memory window.
26. A memory window table according to claim 24, wherein the memory window record includes a virtual address corresponding to the first location of
- 10 the memory window.
27. A memory window table according to claim 24, wherein the memory window record includes a length corresponding to the length of the memory window.
28. A memory window table according to claim 24, wherein the memory
- 15 window record includes a region key for accessing a memory region.
29. A memory window table according to claim 24, wherein the memory window record includes a window key for accessing a memory window.
30. A memory window table according to claim 24, wherein the memory region record includes a protection domain value for the memory region.
- 20 31. A memory window table according to claim 24, wherein the memory region record includes a virtual address corresponding to the first location of the memory region.
32. A memory window table according to claim 24, wherein the memory region record includes a length corresponding to the length of the memory
- 25 region.
33. A memory window table according to claim 24, wherein the length of the memory window record is equal to the length of the memory region record.